U.S. Department of the Interior
Bureau of Land Management

STANDARDS AND GUIDELINES FOR RANGELAND HEALTH ASSESSMENT

Ruby #6 (04337) Grazing Allotment

September, 2013

Location: Elko County, Nevada

PREPARING OFFICE

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Chapter 1. Introduction

The Bureau of Land Management (BLM) grazing regulations at 43 CFR 4130.3-1(c) require that grazing permits issued by the BLM contain terms and conditions that ensure conformance with BLM regulations at 43 CFR 4180, which are the regulations under which the Northeastern Great Basin Resource Advisory Council developed the *Northeastern Great Basin Standards and Guidelines for Grazing Administration* (RAC 1997). Recently, the Wells Field Office completed an assessment of the achievement of these standards on the Ruby #6 Allotment. The results of this assessment are presented in this report, which serves to inform the BLM's determination as to whether these standards are being met, and, if they are not being met, whether existing grazing management practices contribute to their lack of attainment.

The approved standards for rangeland health are as follows:

Standard 1. Upland Sites: Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate and landform.

Standard 2. Riparian and Wetland Sites: Riparian and wetland areas exhibit a properly functioning condition and achieve state water quality criteria.

Standard 3. Habitat: Habitats exhibit a healthy, productive, and diverse population of native and/or desirable plant species, appropriate to the site characteristics, to provide suitable feed, water, cover and living space for animal species and maintain ecological processes. Habitat conditions meet life cycle requirements of threatened and endangered species.

Standard 4. Cultural Resources: Land use plans will recognize cultural resources within the context of multiple-use.

Standard 5. Healthy Wild Horse and Burro Populations: Wild horses and burros exhibit characteristics of a healthy, productive, and diverse population. Age structure and sex ratios are appropriate to maintain the long term viability of the population as a distinct group. Herd management areas are able to provide suitable feed, water, cover and living space for wild horses and burros and maintain historic patterns of habitat use.

This assessment will assess Standards 1-4 only. Standard 5 is not applicable on this allotment as it is not located within a Herd Management Area.

Chapter 2. Allotment Description

The Ruby #6 Allotment is located approximately 30 miles southeast of Elko, NV and 40 miles south of Wells, NV. The allotment encompasses 16,729 acres, of which 15,061 acres are public land administered by the BLM (see Appendix B, Map 1). Private land within the allotment is separated from public land and is not managed by the BLM. The allotment sits in the dry lake bottom and sloughs of Ruby Valley, seven miles east of the Ruby Mountains. Withington Creek and Franklin River run through the allotment, but only contain water following spring snowmelt or during prolonged wet periods. Land surface elevation averages 5,980 feet above sea level, varying only 40 feet from the highest to the lowest point within BLM administered portions of the allotment. The 30-year crop-year (October-June) precipitation median for the Ruby Lake National Wildlife Refuge weather station (26 miles southwest of the allotment) is 12.16 inches (Figure 1).

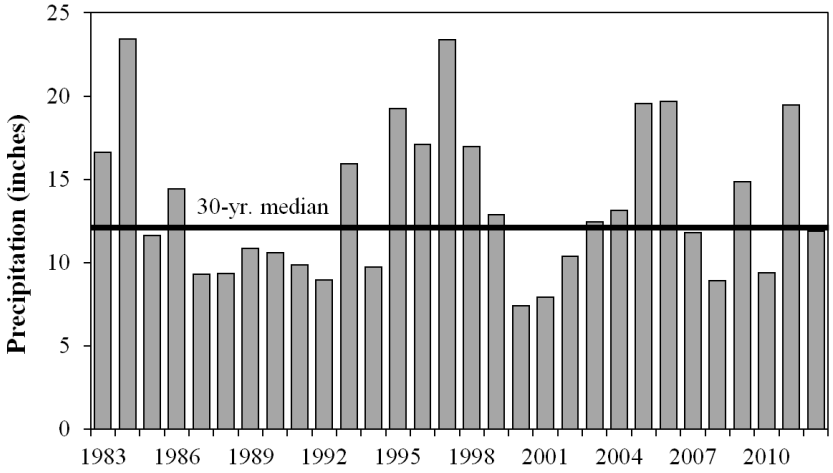


Figure 1. Crop-year median precipitation for the Ruby Lake National Wildlife Refuge weather station (26 miles southwest of the Ruby #6 allotment).

A boundary fence separates Ruby #6 from adjacent allotments. Fencing also divides the allotment internally into three pastures: A, B, and C. Pastures A, B, and C are located in the northwestern, northeastern, and southern portions of the allotment and comprise 16%, 41%, and 43% of total allotment land area, respectively. The BLM has also authorized the installation and operation of seven livestock watering wells within the allotment, six of which are currently operated by the grazing permittees. In the last 60 years a total of four vegetation treatments have been implemented in the Ruby #6 allotment. These have included sagebrush reduction treatments (i.e. chaining, mowing, or chemical herbicide treatments) (pasture A) and drill seeding of crested wheatgrass (*Agropyron cristatum*) (all pastures) (Appendix B, Map 1). Presently, little evidence exists that indicates any level of treatment success. The drill seedings show very limited residual crested wheatgrass and the chemical treatment has been almost completely recolonized by shrubs.

There are three term grazing permits that authorize livestock grazing in the Ruby #6 allotment. These permits are summarized in Table 1. Current livestock management practices consist of a three pasture rest rotation system where pastures A and C are grazed every other year from May

1st – June 22nd. Pasture B is grazed every year from June 23rd – August 15th. All current practices were implemented with the Ruby #6 allotment management plan (AMP) dated April 14, 1980, as amended by the district managers final multiple use decision (FMUD) dated April 18, 1985. Historic permitted and actual use data for the allotment spanning from 1972-2012 are summarized in Appendix A, Figures 3 and 4.

Table 1. Summary of the current term grazing permits for the Ruby #6 allotment.

Authorization	Livestock	AUMs		Permit Term	
Number	Number/Kind	Active	Suspended	Start	End
2701100	172 Cattle	606	0	3/1/12	2/28/22
2701101	100 Cattle	351	0	"	"
2701041	172 Cattle	606	0	"	"
Total	**444 Cattle**	**1563**	**0**		

The Ruby #6 allotment is dominated by Inter-Mountain Basins Big Sagebrush Shrubland and Inter-Mountain Basins Greasewood Flat land cover types, with Inter-Mountain Basins Semi-Desert Grassland playing a minor role (Appendix B, Map 2). Dominant shrub species include Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), black greasewood (*Sarcobatus vermiculatus*), rabbitbrush (*Chrysothamnus* and *Ericameria* sp.), shadscale saltbush (*Atriplex confertifolia*), and winterfat (*Krascheninnikovia lanata*). Dominant herbaceous species include basin wildrye (*Leymus cinereus*), saltgrass (*Distichlis spicata*), western wheatgrass (*Pascopyrum smithii*), and alkali sacaton (*Sporobolus airoides*). While over 2,900 acres of pastures B and C were seeded with crested wheatgrass from 1960-1975 (Appendix B, Map 1), this species has little presence within the allotment.

No Threatened or Endangered plant or animal species are known to occur within or near the Ruby #6 allotment. Greater Sage-Grouse (*Centrocercus urophasianus*; sage-grouse), a Candidate Species for listing as Threatened or Endangered under the Endangered Species Act, is known to utilize portions of the allotment (C. Collins, personal observation), and several leks (breeding grounds) are located 2-5 miles northeast of the allotment. BLM Instruction Memorandum 2012-043 described two categories of Greater Sage-Grouse habitat: 1) Preliminary Priority Habitat (PPH), and 2) Preliminary General Habitat (PGH). PPH is comprised of areas that have been identified as having the highest conservation value to maintaining sustainable sage-grouse populations. These areas include breeding, late brood-rearing, and winter concentration areas and have been identified by the BLM in coordination with NDOW (Appendix B, Map 3). Preliminary General Habitat is comprised of areas of occupied seasonal or year-round habitat outside of priority habitat, and these areas have also been preliminarily identified. The Ruby #6 allotment contains 9,028 acres of PPH and 476 acres of PGH (Appendix B, Map3).

The allotment provides important year-round habitat for pronghorn antelope (*Antilocapra americana*), including kidding areas. Use by other big game such as elk (*Cervus elaphus*), deer (*Odocoileus hemionus*) and bighorn sheep (*Ovis canadensis*) is considered to be incidental, and

no habitat has been designated by the Nevada Department of Wildlife within the portions of the allotment administered by the BLM. The private land in the northwestern corner of the allotment contains four pivot irrigation systems that typically water alfalfa during the growing season. These fields are left fallow during the remainder of the year. Numerous other wildlife species may use this area of the allotment during all or portions of the year, including migratory birds, raptors, small mammals, reptiles, amphibians, and bats. Some of these may be BLM Special Status Species. See Appendix C for a list of Elko District BLM Special Status Species.

Five permanent rangeland monitoring key areas were established within the Ruby #6 allotment in 1982; four randomly selected sites were sampled to evaluate sage-grouse habitat in 2013 (Appendix A, Table 3; Appendix B, Map 2). Key areas and monitoring sites aid in evaluating rangeland health and in determining sage-grouse habitat suitability and were selected based on general use by livestock, vegetation, ecological site, sage-grouse habitat suitability, and accessibility. Key areas represent range conditions, trends, seasonal degrees of use, resource production values, and wildlife value.

Chapter 3. Draft Determinations

This section makes draft determinations regarding:
1. Progress towards or achievement of the standards for rangeland health,
2. The contributing role of livestock in cases where the standards are not achieved, and
3. The conformance of management practices with established guidelines.

Draft determinations for the Ruby #6 allotment are summarized in Table 2.

Table 2. Draft determinations for the Ruby #6 allotment. As all key areas had similar draft determinations within a standard, this table summarizes determinations at the allotment scale.

Standard	Determination	Contributing Factors	Guidelines Conformance
Upland Sites	Achieving the Standard	N/A	In Conformance
Riparian and Wetland Sites	Not Achieving the Standard, and Not Making Significant Progress	Livestock	Not In Conformance
Habitat	Not Achieving the Standard, and Not Making Significant Progress	Livestock	Not In Conformance
Cultural Resources	Achieving the Standard	N/A	In Conformance

Part I. Standard Achievement Review

Standard 1. Upland Sites
Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate and land form.

As indicated by:

- Indicators are canopy and ground cover, including litter, live vegetation and rock, appropriate to potential of the site.

Conclusion: Achieving the Standard

Canopy and ground cover were measured at three key areas in 2010 and 2013 using the point cover method (KA-1, KA-2, and KA-3). These data were then compared to reference rangeland ecological site description (ESD) data available at each key area to determine whether or not the standard was being met. Production and frequency data were used to further inform this discussion and were collected at four key areas in 1983, 1987, 2010, and 2013 using the double weight sampling and nested frequency methods, respectively (Nevada Range Studies Task Group 1984).

Rangeland monitoring data and professional observation support the assertion that ecological sites throughout the Ruby #6 allotment have seen a decline in herbaceous species in the last 30 years; this decline has coincided with widespread shrub encroachment (Appendix A, Table 4, Figure 5, and Figures 8-12). While these community changes may have affected Standard 3, they have not detrimentally impacted upland soil characteristics within the allotment – current levels of canopy and ground cover support infiltration and permeability rates that are appropriate to the site (Appendix A, Figure 16).

Key area 1 occurs within a saline bottom 6-8 inch precipitation zone ecological site (028BY004NV), based on soil surveys and ecological site descriptions developed by the Natural Resource Conservation Service (NRCS) (NRCS 2002). This ecological site occurs on lake terraces at elevations of 5300-6200 feet and slopes of 0-4 percent. The soils in this site are deep, calcareous, and strongly salt and sodium-affected. They are also poorly drained and exhibit ponding in some areas. Potential for sheet and rill erosion is slight. The plant community is dominated by black greasewood, basin wildrye, and alkali sacaton. Saltgrass, western wheatgrass and rubber rabbitbrush are other important species associated with the site. Live vegetation cover (basal and crown) at this site is expected to range from 15-30% (NRCS 2006).

Key areas 2 and 3 occur within a sodic terrace 8-10 inch precipitation zone ecological site (028BY028NV), based on soil surveys and ecological site descriptions developed by the NRCS (NRCS 2002). This ecological site occurs on fan skirts at elevations of 5600-6000 feet and slopes of 2-4 percent. The soils in this site are deep, from mixed sources, and moderately to strongly salt and sodium-affected. They are also somewhat poorly drained with slow runoff rates. The plant community is dominated by black greasewood, big sagebrush, and basin wildrye. Indian ricegrass is an additional important species associated with the site. Live vegetation cover (basal and crown) at this site is expected to range from 10-20% (NRCS 2006).

In key area 1, vegetation cover was 17% in 2010 and 14% in 2013. Litter, embedded litter, and rocks provided an additional 32% and 25% ground cover in 2010 and 2013, respectively. In key area 2, vegetation cover was 9% in both 2010 and 2013, while additional ground cover values (e.g. litter, embedded litter, and rocks) were 10% and 14% in 2010 and 2013, respectively. In key area 3, vegetation cover was 10% in 2010 and 9% in 2013. Additional ground cover values for key area 3 were 12% and 16% in 2010 and 2013, respectively.

While these live vegetation cover values fall at or slightly below the minimum value estimated for each of these sites (Appendix A, Figure 16), drought was a major factor in both 2010 and 2013 (Figure 1). When this is considered in conjunction with the erosive potential of this site, these data – while not optimal – support the assertion that Standard 1 is being met in key areas KA-1, KA-2, and KA-3. Additional indicators of infiltration and permeability rates (e.g. rills, gullies, water flow patterns, pedestals, wind scouring, blowouts, depositional features, microbiotic crust presence, etc.) are appropriate to soil type, climate, and land form based on professional observation.

Standard 2: Riparian and Wetland Sites
Riparian and wetland areas exhibit a properly functioning condition and achieve state water quality criteria.

As indicated by:

- Stream side riparian areas are functioning properly when adequate vegetation, large woody debris, or rock is present to dissipate stream energy associated with high water flows. Elements indicating proper functioning condition such as avoiding accelerating erosion, capturing sediment, and providing for groundwater recharge and release are determined by the following measurements as appropriate to the site characteristics.

    - Width/Depth ratio; Channel roughness; Sinuosity of stream channel; Bank stability; Vegetative cover (amount, spacing, life form); and other cover (large woody debris, rock).
    - Natural springs, seeps, and marsh areas are functioning properly when adequate vegetation is present to facilitate water retention, filtering, and release as indicated by plant species and cover appropriate to the site characteristics.
    - Chemical, physical and biological water constituents are not exceeding the state water quality standards.

Conclusion: Not Achieving the Standard, and not making significant progress toward standard

Water bodies in the Ruby #6 Allotment include Franklin River, Withington Creek and several unnamed ponds. Flow in these water bodies is intermittent, only flowing or holding water during wet years. The presence of water in these streams and ponds is so sporadic that only a small portion of Withington Creek at the northern margin of the allotment expresses obligate riparian vegetation.

A riparian condition assessment was conducted in April 2013 to determine Standard 2 achievement. Riparian condition assessments evaluate the functionality of riparian areas based on hydrological, vegetation, and soils/erosional factors, within the context of the geologic setting and the potential of the area. Although based on quantitative science, these assessments are qualitative in nature. Prichard et al. (1999) define proper functioning spring and lentic areas as follows:

> "Lentic riparian-wetland areas are functioning properly when adequate vegetation, landform, or debris is present to:
>
> 1) dissipate energies associated with wind action, wave action, and overland flow from adjacent sites, thereby reducing erosion and improving water quality;
> 2) filter sediment and aid floodplain development;
> 3) improve flood-water retention and ground-water recharge;
> 4) develop root masses that stabilize islands and shoreline features against cutting action;
> 5) restrict water percolation;
> 6) develop diverse ponding characteristics to provide the habitat and water depth, duration, and temperature necessary for fish production, water bird breeding, and other uses;
> 7) and support greater biodiversity."

The portion of Withington Creek containing obligate riparian species was chosen as the area to be assessed. While not flooded recently, this area contained species that require frequent flooding. The riparian condition assessment concluded that the area could support vigorous riparian vegetation, but that the key riparian species had been heavily impacted by livestock grazing and actively replaced by invasive species. The resultant community had an extremely low density of widely dispersed riparian obligate individuals. BLM specialists concluded that the observed impacts would preclude the reestablishment of a vigorous riparian community on a wet year. In contrast to the area assessed within the allotment, adjoining portions of the same riparian area located on private land contained vigorous riparian vegetation that lacked evidence of heavy grazing or a strong invasive species presence (see Figure 2).

The site was rated as being functional at risk with downward trend (FARD). Accordingly, Standard 2 is not met for Pasture A of the Ruby #6 Allotment as plant species and cover are not adequate for the riparian area within that pasture. Standard 2 was not evaluated for pastures B and C as riparian areas or perennial water resources are lacking within those pastures.

Figure 2. Ruby #6 allotment boundary fenceline photograph showing the riparian area in the northwest section of pasture A. The area to the left of the fence is private, while the area to the right is public and within the Ruby #6 allotment.

Standard 3: Habitat
Habitats exhibit a healthy, productive, and diverse population of native and/or desirable plant species, appropriate to the site characteristics, to provide suitable feed, water, cover and living space for animal species and maintain ecological processes. Habitat conditions meet life cycle requirements of threatened and endangered species.

As indicated by:

- Vegetation composition (relative abundance of species);
- Vegetation structure (life forms, cover, height, or age class);
- Vegetation distribution (patchiness, corridors);
- Vegetation productivity; and
- Vegetation nutritional value.

Conclusion: Not Achieving the Standard, and not making significant progress toward standard

Overall Wildlife

Data collected at permanently established range/wildlife key areas indicate that vegetative composition changed drastically between the 1980's and the present. Specifically, key areas have transitioned from heavily grass-dominated sites to heavily shrub-dominated sites (Appendix A, Table 4, Figure 5, and Figures 8-12). In the late 1980's KA-1 was 75% basin wildrye by weight, and AY-1 was 48% alkali sacaton. By 2010, basin wildrye and alkali sacaton composition had declined by more than 60%, while rubber rabbitbrush had seen a 36-fold increase at KA-1 (see Appendix A, Figures 8 and 10) and a 132% increase at AY-1. The ESD for these key areas states: "as ecological condition declines, black greasewood and rubber rabbitbrush increase,

while basin wildrye and alkali sacaton decrease. With further site degradation, rubber rabbitbrush typically becomes the dominant species." Similarity indices indicate that within the last 30 years these sites have transitioned from the PNC to highly degraded, less desirable states (Appendix A, Figure 6).

Key Area 2 also exhibited a highly dynamic vegetative community from the 1980's to the present. Over that period, this site lost the substantial grass component present in the 1980s (including a 92% decline in the composition of basin wildrye) and transitioned to a shrub-dominated, less desirable state (Appendix A, Table 4, Figures 5, 6, 9, and 11). As described in the ESD, this change is indicative of degrading ecological condition: "as ecological condition declines, black greasewood, rubber rabbitbrush, big sagebrush and annuals increase, while basin wildrye and palatable forbs decrease." Although the similarity indices for KA-3 and KA-4 did not decline between the 1980's and now (Appendix A, Figure 6), these sites saw similar losses to grasses and increases in shrubs (Appendix A, Table 4, Figures 5 and 12).

Basin wildrye is a tall bunchgrass that provides excellent cover for small animals and birds, excellent nesting habitat for upland birds, and excellent forage and cover during winter for big game animals (Ogle et al. 2012). Basin wildrye is intolerant of heavy use during the spring and summer because it has elevated growing points that are easily damaged by overgrazing (Krall et al. 1971). Some have suggested that it is best suited for grazing only during the winter months, as regular growing season use can result in severe declines in forage yield (Perry and Chapman 1974).

The near complete loss of basin wildrye from the allotment since the 1980's represents a serious decline in habitat quality for wildlife species in general. When this loss is viewed in conjunction with the drastic shifts in community composition apparent throughout the allotment, it is clear that habitat suitability has declined in the last 30 years for species that benefit from structurally diverse vegetative communities (e.g. pronghorn antelope, small mammals, migratory birds). For pronghorn antelope habitat specifically, this decline has likely been ongoing over a longer period of time. Antelope habitat condition was rated in 1989 and again in 2013 at AY-1, and while the 2013 score was lower than the 1989 score, both ratings were Fair overall and similarly limited by the lack of forbs and overabundance of shrubs (Appendix A, Table 7).

An additional factor negatively influencing the quality of antelope habitat throughout the allotment is improper fence construction. The pasture fence dividing Pastures B and C serves as a good example (Appendix A, Figure 14). The problems with this fence are as follows: 1) it consists of four strands of barbed wire, rather than the preferable three, 2) a smooth bottom wire is lacking, 3) wire spacing is tight, approximately 10"-10"-10"-10", rather than the preferred 16"-10"-12" or 18"-10"-12" wildlife spacing (BLM Handbook 1741-1), and 4) it has an average post spacing of approximately 50', rather than 22'.

Special Status Species: Greater Sage-Grouse

As a sagebrush-obligate, landscape-scale species and current candidate for listing as a Threatened or Endangered Species, sage-grouse is an appropriate umbrella species to represent the habitat needs of a suite of sagebrush-obligate and near-obligate species, including sage

thrasher (*Oreoscoptes montanus*), pygmy rabbit (*Brachylagus idahoensis*) (both BLM Sensitive Species), Brewer's sparrow (*Spizella breweri*), sagebrush sparrow (*Artemisiospiza nevadensis*) and sagebrush vole (*Lemmiscus curtatus*). It is assumed that managing for habitat characteristics that benefit the sage-grouse will also generally benefit other species that fall under the sage-grouse "umbrella" (Rowland et al. 2006).

Monitoring data, field observation and photo documentation indicate that the majority of the sagebrush vegetation community within the Ruby #6 allotment lacks the herbaceous component expected and necessary for the support of sage-grouse. At the four sites measured in PPH in 2013 (SG-1, SG-2, SG-3, SG-4) (see Appendix A, Table 3), we found overall vegetation composition had diverged significantly from the potential natural community (PNC). The ESDs for all four sites describe potential grass, forb, and shrub composition as 50%, 5%, and 45% by weight, respectively; however, sagebrush comprised 96-100% of the vegetation (by cover) (Appendix A, Table 5). Grasses and forbs were severely limited, lacking completely at two sites (Appendix A, Table 5 and Figure 13). Although a comparison between cover and weight is not ideal, in this case it still is relevant due to the nature of the data collected in 2013 (e.g. a site with 100% sagebrush cover would also have 100% sagebrush composition, by weight).

While sage-grouse hens are known to select nest sites containing taller and/or more dense vegetative cover than random sites (Wallestad and Pyrah 1974; Wakkinen 1990; Fischer 1994; Aldridge and Brigham 2002; Popham and Gutierrez 2003; Kaczor 2008), our data indicate that vegetation communities at the four PPH sites do not meet the life cycle requirements and habitat needs for sage-grouse nesting or brood-rearing. These sites lack the herbaceous structure necessary for the concealment of nests and chicks, and foraging for broods (Drut et al. 1994; Gregg et al. 1994; DeLong et al. 1995; Sveum et al. 1998a, Sveum et al. 1998b; Connelly et al. 2000; Lyon 2000; Holloran et al. 2005; Hagen et al. 2007; Connelly et al. 2011). At SG-1 and SG-2, sagebrush canopy cover alone exceeded the total cover value estimated for all species in the ESD (10-20%), and exceeded the range recommended by Connelly et al. (2000) for productive sage-grouse habitat (15-25%) (Appendix A, Table 6). Although research in northern Elko County has suggested that sage-grouse may benefit from 20-30% sagebrush canopy cover in areas where raven numbers are abnormally high and the herbaceous understory is depleted (Coates and Delehanty 2010), the near absence of herbaceous vegetation in the Wyoming big sagebrush sites nevertheless represents unsuitable nesting and brood-rearing conditions for sage-grouse. Any nesting by sage-grouse is likely to be sporadic given current habitat conditions. This state also represents undesirable habitat quality for many other sagebrush-associated wildlife species.

Herbaceous vegetation is not an essential component of winter habitat (Connelly et al. 2000). Therefore, sagebrush communities within the allotment may provide suitable winter habitat for sage-grouse, which have been reported to use sites with 10-30% sagebrush cover in the winter (Eng and Schladweiler 1972; Wallested 1975, Connelly et al. 2000). In spring 2013, a sage-grouse roost site, consisting of a concentrated pile of sage-grouse fecal pellets in a bare interspace between shrubs, was observed near SG-2. This site appeared to date from the previous winter.

An additional factor negatively affecting sage-grouse habitat quality throughout the allotment is related to range improvement structures and the artificial nest sites they may provide for sage-grouse predators. While monitoring vegetation in May-June 2013, BLM specialists incidentally observed the presence of active Common Raven (*Corvus corax*) nests on two water storage tanks at livestock wells in pastures A and B, another on an abandoned bridge crossing the Franklin River in pasture C, and a fourth on a ceremonial wooden pole structure in pasture A. Ravens are the primary nest predator of sage-grouse in northeastern Nevada and may significantly impact nesting success of incubating hens (Coates and Delehanty 2004, Coates 2007, Coates et al. 2008, Coates and Delehanty 2010). The presence of anthropogenic diet subsidies (e.g., landfills and road kill) and artificial nesting substrates (e.g., transmission towers and some rangeland improvements, such as the water tanks in Ruby #6) have allowed raven populations to increase by up to 1500% in some parts of the West (Coates and Delehanty 2010). An exhaustive, formal survey to determine raven occupation of all potential anthropogenic nesting substrates within the allotment was not conducted, but undoubtedly the presence of such substrates within an otherwise tree-challenged landscape represents a potentially serious, although unquantifiable, degradation of sage-grouse habitat. Improperly constructed fences also pose a hazard to sage-grouse through increased collision risk (Stevens et al. 2012; Appendix A, Figure 14).

In conclusion, data collected across the allotment over 30 years show that 1) vegetation composition has become highly skewed toward shrubs over the monitoring period, 2) habitats do not exhibit a healthy, productive, and diverse population of native and/or desirable plant species, appropriate to the site characteristics, 3) habitats do not provide suitable feed, water, cover and living space for animal species, 4) habitat conditions do not meet the life cycle requirements of Greater Sage-Grouse, a candidate species for listing and umbrella species for sagebrush-associated wildlife, and 5) ecological processes have been altered, putting ecosystem services at risk.

Standard 4: Cultural Resources
Land use plans will recognize cultural resources within the context of multiple-use.

Conclusion: Achieving Standard

Rangeland management plans, including term grazing permit renewals will consider listings of sites that are potentially eligible for listing on the National Register of Historic Places (NRHP) or considered to be of cultural significance as well as new NRHP eligible sites as they become known. Based on the evaluation of existing information pertaining to range improvements and grazing, cultural resources are being recognized within the context of multiple-use management in the Ruby #6 Allotment.

Part II. Livestock as a Contributing Factor in not Meeting the Standards

According to the Standards and guidelines for Nevada's Northeastern Great Basin Area, it must be determined if livestock grazing is a contributing factor in the non-attainment of the Standards and Guidelines (RAC 1997).

Standard 1. Upland Sites

This standard is being achieved in the Ruby #6 allotment.

Standard 2. Riparian and Wetland Sites

Standard 2 is not met for Pasture A of the Ruby #6 Allotment and livestock are identified as a causal factor. The Riparian Condition assessment specified that the apparent differences in vegetation composition and vigor between the public and private portions of this riparian area were at least partially a result of livestock use.

Standard 3. Habitat

Actual use data indicate that in the last 30 years pastures A, B and C were grazed almost every year from early May to mid-June; pasture A was rested eight of those 30 years, pasture B was never rested, and pasture C was rested five of the 30 years. This near continuous growing season use is especially concerning when viewed in conjunction with utilization and precipitation data over this same time period. Between the 1980's and the present, utilization often exceeded 50% for key species and 60% of these high utilization events occurred in years where precipitation was below average, (Appendix A, Figure 17). In short, the heaviest grazing use occurred on drought years. This particular combination of disturbance factors has been shown to be especially detrimental to arid Wyoming sagebrush communities – such as those found in Ruby #6 (Loeser et al. 2007, Reisner 2010, Evers et al. 2013) – often hastening degradation, increasing the cover of woody and annual invasive species, and contributing to the decline of native perennial grasses. For basin wildrye specifically, 75% of high utilization events occurred on years with below average precipitation (Appendix A, Figure 17). Considering the physiology of basin wildrye (Ogle et al. 2012), the result – a widespread decline in basin wildrye – is not surprising (Appendix A, Figure 5).

It is important to note here that the apparent scope and speed of the decline in herbaceous native vegetation from 1983-2013 was likely magnified by several extraneous factors, including the loss of the crested wheatgrass seedings and climate. Photographic evidence suggests that in the early 1980's crested wheatgrass seedings in the Ruby #6 allotment were vigorous in pasture A and present though weaker in pasture B (Appendix A, Figure 15). Around that same time period, the Ruby Valley experienced several very wet years (Figure 1) that greatly bolstered production in herbaceous vegetation types. It is likely that in 1983, the year initial monitoring data were collected in Ruby #6, much of the grazing pressure was directed towards the seedings. As these seedings declined with heavy use in the late part of that decade (75% of the utilization data points after 1983 in pasture A exceeded 60%), grazing pressure on the native grasses increased.

Professional observation and repeat photography indicate that crested wheatgrass has been all but eliminated from the Ruby #6 allotment (Appendix A, Figure 15).

In short, our baseline data in the Ruby #6 allotment were collected at a time when conditions were prime for herbaceous production, and utilization was shared between native and seeded vegetation, whereas recent data were collected decades after the loss of the seedings and during drought or normal precipitation years. While these variables likely influenced the scope and the speed of the perceived decline in herbaceous vegetation in Ruby #6, they do not vindicate livestock as a factor contributing to this decline. Indeed, when we consider the condition of the Ruby #6 just 30 years ago – abundant herbaceous vegetation and viable seedings – it is clear that natural successional processes have been accelerated by livestock management in this allotment.

These data, in combination with those data previously discussed, strongly suggest that current livestock grazing management practices are contributing to the habitat degradation observed in the Ruby #6 allotment, and are thus directly related to the non-achievement of Standard 3. In addition, 1) as stated in the key area ESDs, these degraded sites are at risk of further degradation – invasion by undesirable species such as Russian thistle (*Salsola kali*) and cheatgrass (*Bromus tectorum*) is a tangible threat within the allotment – and 2) the failure to meet Standard 2 indicates a lack of suitable habitat for riparian obligate or riparian-associated species. These findings highlight the risks to ecological function and illustrate the acute management needs within this allotment.

Standard 4. Cultural Resources

This standard is being achieved in the Ruby #6 allotment.

Part III. Guideline Conformance

Standard 1. Upland Sites

Current livestock grazing management is in conformance with Guidelines.

Standard 2. Riparian and Wetland Sites

Standard 2 is not met for Pasture A in the Ruby #6 Allotment and livestock are identified as a causal factor. Current practices are not resulting in significant progress toward the standard, indicating livestock grazing management is not in conformance with the guidelines 2.1, 2.2, and 2.4 (RAC 1997), shown below:

- 2.1 - Livestock grazing management and wild horse and burro population levels will maintain or promote sufficient vegetation cover, large woody debris, or rock to achieve proper functioning condition in riparian and wetland areas. Supporting the processes of energy dissipation, sediment capture, groundwater recharge, and stream bank stability will thus promote stream channel morphology (e.g., width/depth ratio, channel roughness, and sinuosity) appropriate to climate, landform, gradient, and erosional history.
- 2.2 - Where livestock grazing management and wild horse and burro herd management are not likely to restore riparian and wetland sites, land management treatments should be designed and implemented where appropriate to the site.
- 2.4 - Livestock grazing management and wild horse and burro herd management are adequate when significant progress is being made toward this standard.

Standard 3. Habitat

Standard 3 is not met in the Ruby #6 allotment and livestock are identified as a causal factor. Current practices are not resulting in significant progress toward the standard, indicating livestock grazing management is not in conformance with guidelines 3.1, 3.2 and 3.6 (RAC 1997), shown below:

- 3.1 - Livestock grazing management and wild horse and burro population levels will promote the conservation, restoration and maintenance of habitat for threatened and endangered species, and other special status species as may be appropriate.
- 3.2 - Livestock grazing intensity, frequency, season of use and distribution and wild horse and burro population levels should provide for growth and reproduction of those plant species needed to reach long-term land use plan objectives. Measurements of ecological condition and trend/utilization will be in accordance with techniques identified in the Nevada Rangeland Monitoring Handbook.
- 3.6 - Livestock grazing management and wild horse and burro herd management are adequate when significant progress is being made toward this Standard.

Standard 4. Cultural Resources

Current livestock grazing management is in conformance with Guidelines.

Part IV. Management Recommendations to Achieve Standards and Conform with Guidelines

As detailed in Part III, Standards 2 and 3 are not being met and current livestock grazing management is not in conformance with the respective guidelines. These Standards will not likely be met in the future without changes in livestock management. The BLM suggests the following changes in livestock management be considered (singly or in combination) within the Ruby # 6 Allotment:

- Change season of use and implement a rest-rotation grazing system that includes all pastures in the allotment.
- Develop utilization objectives for key forage species.
- Complete vegetation treatments to promote growth of herbaceous species.
- Retrofit fences to wildlife friendly specifications.
- Calculate and implement a new stocking rate based on current production.

Chapter 4. Signature Page

_____ _____

Bryan K Fuell
Manager, Wells Field Office

Date

Appendix A. Data Summary

A.1. Livestock Actual Use

Livestock actual use data has been collected on the Ruby #6 allotment from 1972-2012. Since 1985, the permitted actual use has been 1,606 animal unit months (AUMs) and livestock use has rotated within three pastures across the grazing season, with pastures A and C being used in the early summer every other year, and pasture B being used in the late summer every year. Actual use data show some deviation from this permitted use – in the last 30 years pastures A and C ought to have been rested a total of 15 years each, over that period pasture A was rested eight years and pasture C was rested five years. Actual use data are summarized in Figures 3 and 4. Annual variation in livestock use has occurred for several reasons including various business decisions of the permittees, annual forage availability, and transfers in grazing preference.

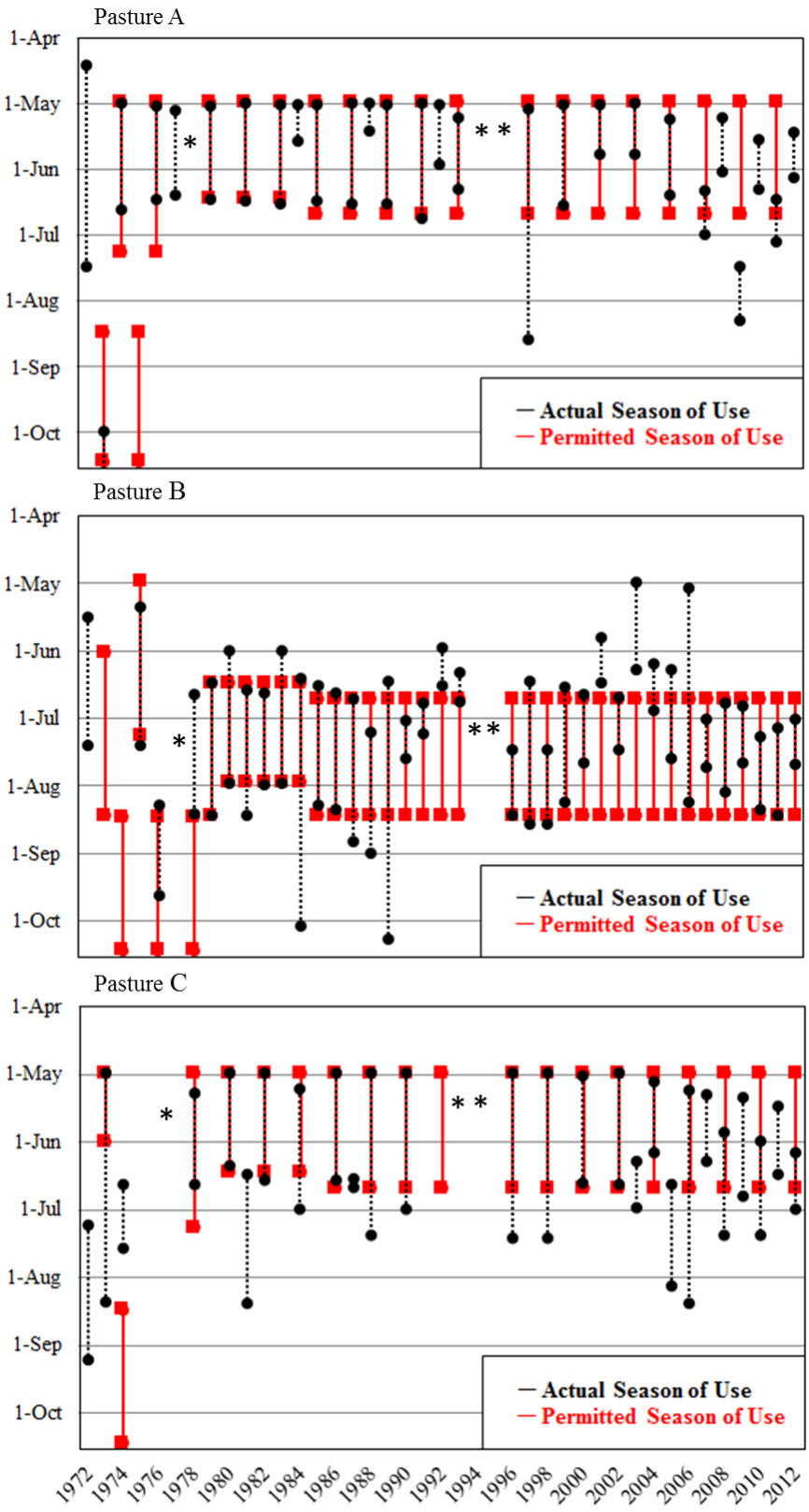


Figure 3. Permitted and actual season of use data by pasture for Ruby #6, spanning from 1972-2012. Asterisks indicate years where data is missing.

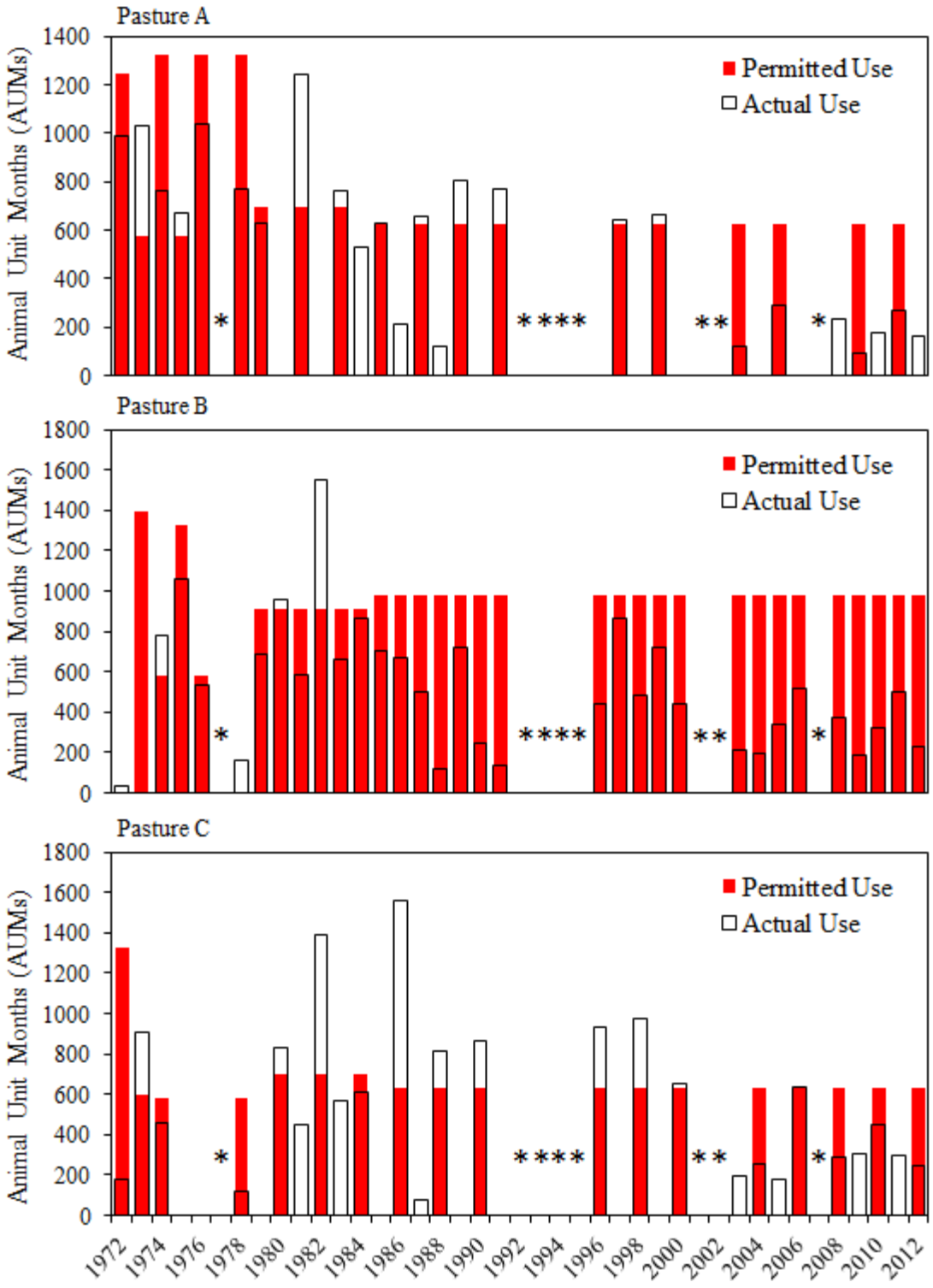


Figure 4. Permitted and actual use data by pasture for Ruby #6, spanning from 1972-2012. Asterisks indicate years where data are missing.

A.2. Key Areas and Ecological Sites

A key area is a relatively small portion of an allotment selected to monitor change in vegetation or soil and management impacts. It is assumed that properly located key areas will reflect the current management over similar areas at larger scales (Swanson et al. 2006). Table 3 depicts the location, ecological site, dominant species, and soil mapping unit of each key area within the Ruby #6 allotment.

Table 3. Ruby #6 allotment key areas.

Key Area	Pasture	Location	Ecological Site	Dominant Species (from ESD)	Soil Mapping Unit
KA-1	A	T31N R59E Sec. 24 NE SE	Saline Bottom 6-8" PZ (028BY004NV)	Black Greasewood, basin wildrye, alkali sacaton	765 - Umberland-Wendane association
KA-2	C	T31N R60E Sec. 30 SE SW	Sodic Terrace 8-10" PZ (028BY028NV)	Black Greasewood, Wyoming big sagebrush, basin wildrye	541 - Kunzler-Sheffit association
KA-3	B	T31N R60E Sec. 21 SE NW	Sodic Terrace 8-10" PZ (028BY028NV)	Black Greasewood, Wyoming big sagebrush, basin wildrye	827—Kunzler-James Canyon association
KA-4	A	T31N R60E Sec. 18 NW SW	Loamy 8-10" PZ (028BY010NV)	Wyoming big sagebrush, indian ricegrass, needle and thread	1651 - Shantown association
AY-1	B	T31N R60E Sec. 20 NE NW	Saline Bottom 6-8" PZ (028BY004NV)	Black Greasewood, basin wildrye, alkali sacaton	1670 - Wendane-Logan-Wendane, occasionally flooded association
SG-1	A	T31N R59E Sec. 13 NE SE	Loamy 8-10" PZ (028BY010NV)	Wyoming big sagebrush, indian ricegrass, needle and thread	1651 - Shantown association
SG-2	C	T31N R60E Sec. 29 SE NE	Loamy 8-10" PZ (028BY010NV)	Wyoming big sagebrush, indian ricegrass, needle and thread	1412—Threesee-Idway association
SG-3	C	T31N R60E Sec. 26 NE SW	Loamy Plain 8-10" PZ (028BY014NV)	Wyoming big sagebrush, indian ricegrass, western wheatgrass	1210—Blimo-Kunzler-Linoyer association
SG-4	B	T31N R60E Sec. 23 SE NE	Loamy Plain 8-10" PZ (028BY014NV)	Wyoming big sagebrush, indian ricegrass, western wheatgrass	1210—Blimo-Kunzler-Linoyer association

An ecological site is a kind of land with a specific potential natural community and specific physical site characteristics, differing from other kinds of land in its ability to produce vegetation and to respond to management (Holechek et al. 2010). An Ecological Site Description (ESD) is used to provide reference in the inventory, evaluation, and management of native vegetation communities. The ecological site of a key area is determined based on several factors including soils, topography, and the plant community.

A.3. Community Composition

Community composition was measured by collecting production data at each key area using the double weight sampling method. Production is defined as the amount of aboveground air-dry biomass produced annually at a site. The double weight sampling method is a commonly used method for estimating production (BLM 1999a; Nevada Range Studies Task Group 1984). Community composition sampling was conducted in 1983, 1987, and 2010 at key areas KA-1, KA-2, and KA-3; 1986, 2010, and 2013 at key area KA-4; and 1989 and 2013 at key area AY-1. These data are summarized in Table 4.

Table 4. Community composition data collected at key areas KA-1, KA-2, KA-3, KA-4, and AY-1 between 1980 and the present. Data are displayed as percentages. Potential natural community (PNC) data were extracted from ecological site descriptions available at each key area.

Class	Key Area	PNC	1983	1986	1987	1989	2010	2013
Grass	KA-1	**80**	90.3	--	86.9	--	25.1	--
	KA-2	**20**	30.3	--	15.9	--	1.5	--
	KA-3	**20**	95.3	--	71.0	--	16.8	--
	KA-4	**50**	77.1	--	--	--	5.2	0.6
	AY-1	**80**	--	--	--	69.6	--	29.6
Forb	KA-1	**5**	0.3	--	0.1	--	0.5	--
	KA-2	**5**	16.6	--	0.0	--	6.4	--
	KA-3	**5**		--	8.2	--	0.4	--
	KA-4	**5**	2.7	--	--	--	0.8	0.2
	AY-1	**5**	--	--	--		--	
Shrub	KA-1	**15**	9.4	--	13.0	--	74.3	--
	KA-2	**75**	52.6	--	84.1	--	92.1	--
	KA-3	**75**	4.3	--	20.8	--	82.9	--
	KA-4	**45**	20.2	--	--	--	94.0	99.2
	AY-1	**15**	--	--	--	30.4	--	70.4

Changes in community composition were interpreted by tracking shifts in plant classes (i.e. grasses, shrubs, and forbs) (Table 4 and Figure 5) and similarity indices over time (Figure 6), for each key area. A similarity index is a measure of how current community composition compares to the estimated potential natural community (PNC). Figure 6 summarizes similarity index data for all of the five key areas where community composition data were collected.

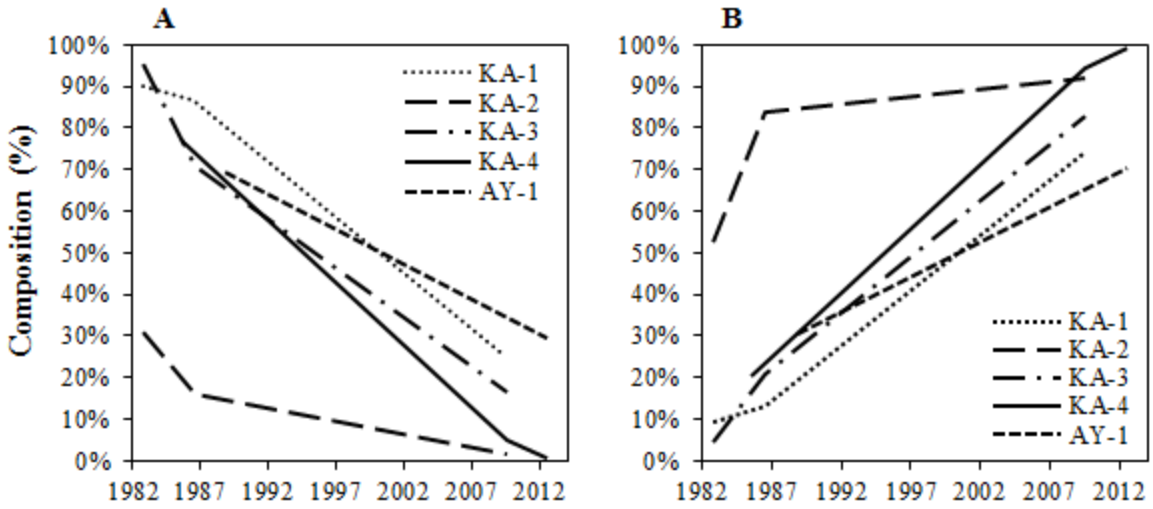


Figure 5. Percent composition of A) grasses and B) shrubs, by weight, as measured in 1983, 1987, and 2010 for KA-1, KA-2, and KA-3; 1986, 2010, and 2013 for KA-4; and 1989 and 2013 for AY-1.

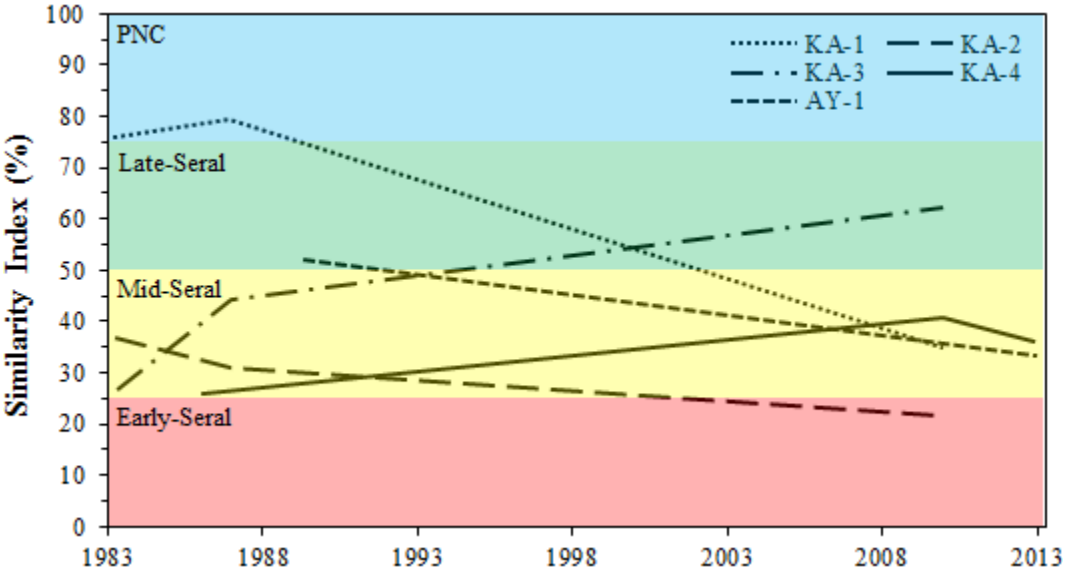


Figure 6. Similarity index data by key area: measured in 1983, 1987, and 2010 in KA-1, KA-2, and KA-3; 1986, 2010, and 2013 in KA-4; and 1989 and 2013 in AY-1. Similarity indices ranging from 0-25%, 25-50%, 50-75%, and 75-100% were designated as early-seral, mid-seral, late-seral, and potential natural community (PNC), respectively.

In calculating similarity indices, the percent composition of each species is measured against the that expected in the PNC of that ecological site. It is important to note that the PNC is not always the most desirable plant community to manage for. Thus, a low similarity index is not always indicative of poor management practices (e.g. seedings).

A.4. Frequency

Frequency is the number of times a plant species is present in a given area. The concept of frequency refers to the uniformity of a species in its distribution over an area. Frequency data were collected between 1983-2013 at key areas KA-1, KA-2, and KA-3 using the nested frequency method (Nevada Range Studies Task Group 1984). Figure 7 summarizes these data.

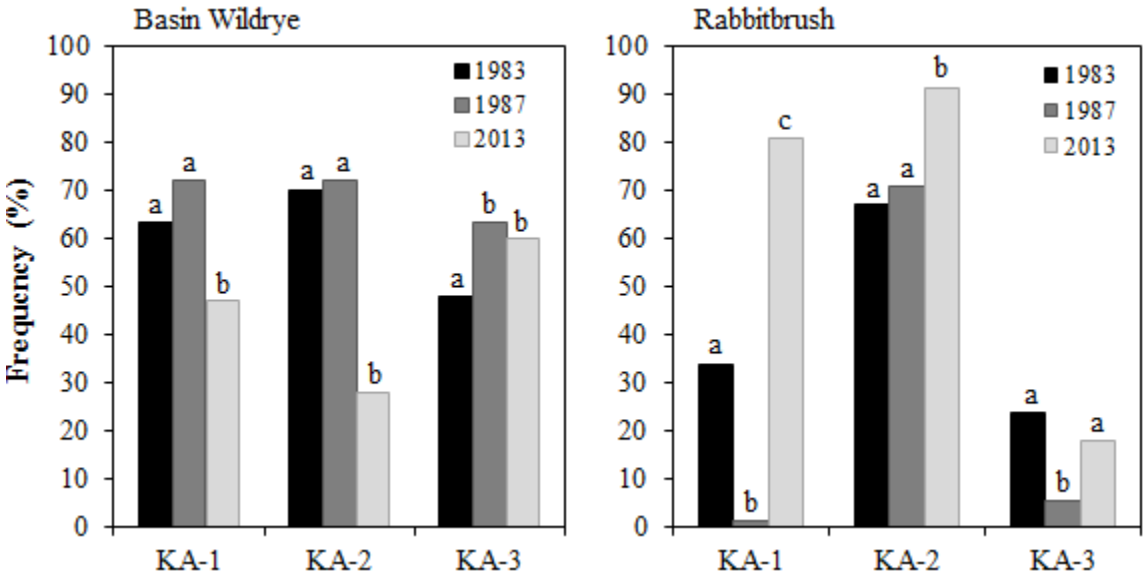


Figure 7. Percent frequency of basin wildrye (*Leymus cinereus*) and rabbitbrush (*Chrysothamnus* and *Ericameria* sp.) species within key areas KA-1, KA-2, and KA-3. Significant differences between years are indicated by differing lowercase letters (Tukey's HSD, $P < 0.05$).

While these data indicate an overall decline in the uniformity of basin wildrye and an increase in the uniformity of rabbitbrush, professional observation indicates that this trend has been dampened – as basin wildrye individuals have declined, they have fragmented, increasing sampling probability. Similarly, as rabbitbrush has come to dominate these key areas, uniformity hasn't necessarily been the attribute most positively affected, rather, it has been the attributes of cover and production that have benefitted most from the encroachment of this species.

A.5. Photographic Data

In reviewing photographs from 1983 to 2013, all photo trend points show a clear shift from herbaceous (primarily grass) dominance to shrub dominance. The highest quality repeat photographs were taken in key areas KA-1, KA-2, and KA-3, these data are displayed in Figures 8-12. At each of these key areas the dominant grass species is basin wildrye. Rubber rabbitbrush is the dominant shrub at KA-1 and KA-2, while black greasewood dominates KA-3. Repeat photography at these key areas show a drastic decrease in basin wildrye and an increase in rubber rabbitbrush, mirroring what is captured in the community composition data (see Appendix A, Figure 5).

Also included are 2013 photos of the randomly selected sage-grouse habitat monitoring sites (Figure 13). These sites were in designated Preliminary Priority Habitat, a habitat type that should provide suitable nesting, brood-rearing, and winter habitat components for sage-grouse. However, these photos and the associated cover data collected at these sites (Appendix A, Table 5) clearly show that the herbaceous understory required by nesting and brood-rearing sage-grouse hens is lacking.

Figure 8. Frame-level repeat photography at key area KA-1. Photo dates are A) 07 July 1987 and B) 04 June 2013.

Figure 9. Frame-level repeat photography at key area KA-2. Photo dates are A) 07 July 1987 and B) 06 June 2013.

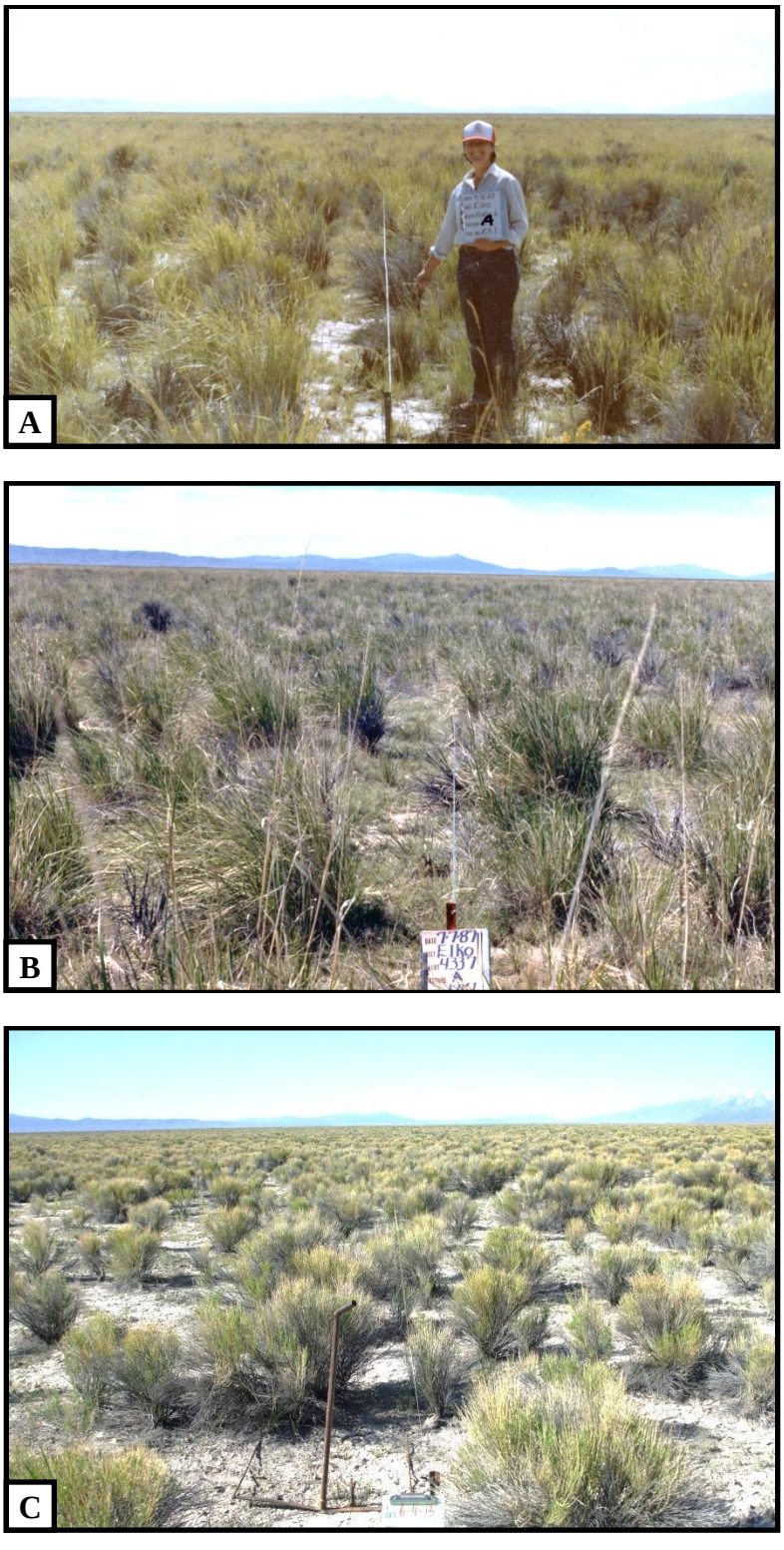


Figure 10. Site-level repeat photography at key area KA-1. Photo dates are A) 08 September 1983, B) 07 July 1987, and (C) 04 June 2013.

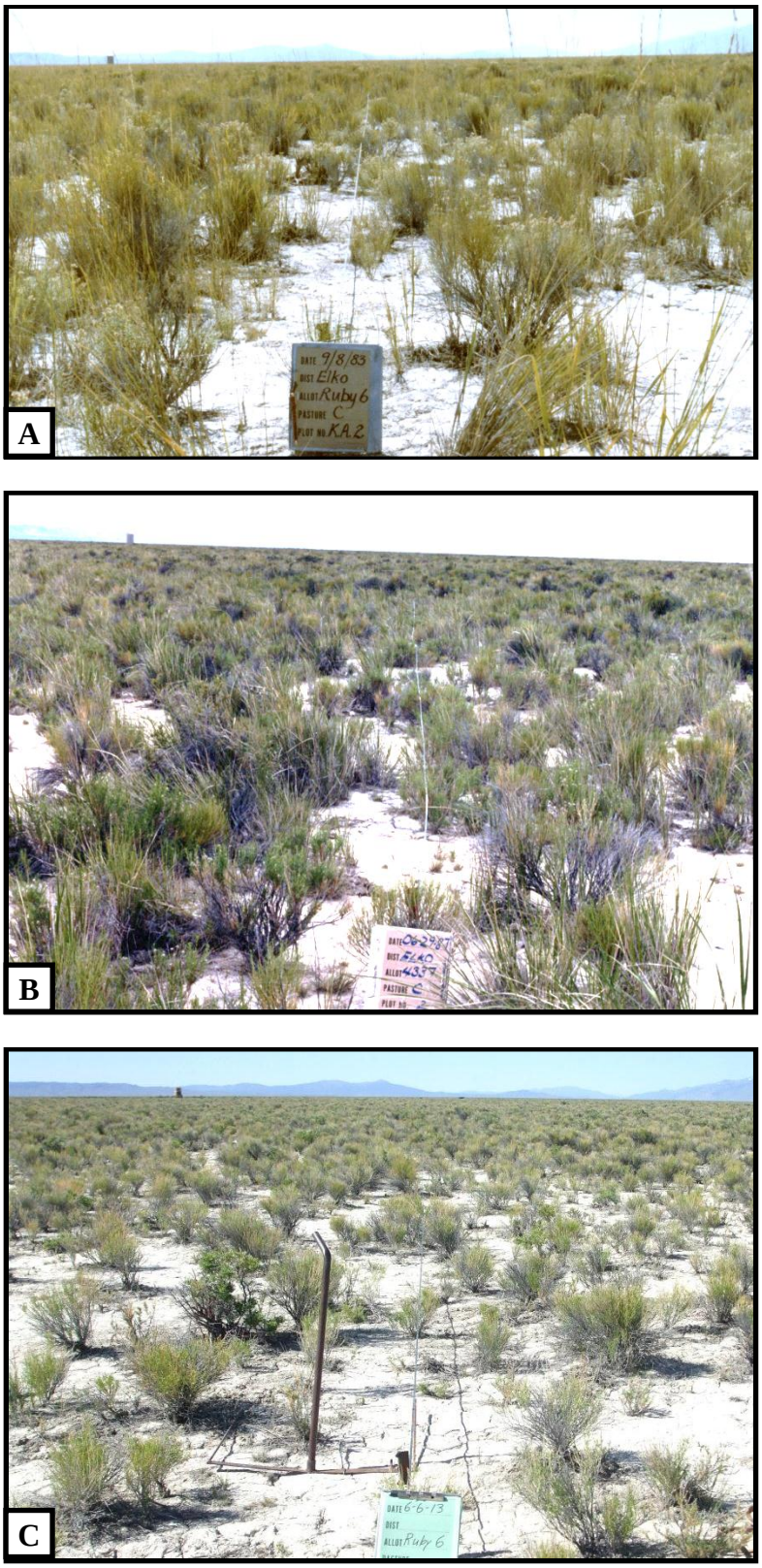


Figure 11. Site-level repeat photography at key area KA-2. Photo dates are A) 08 September 1983, B) 29 June 1987, and C) 06 June 2013.

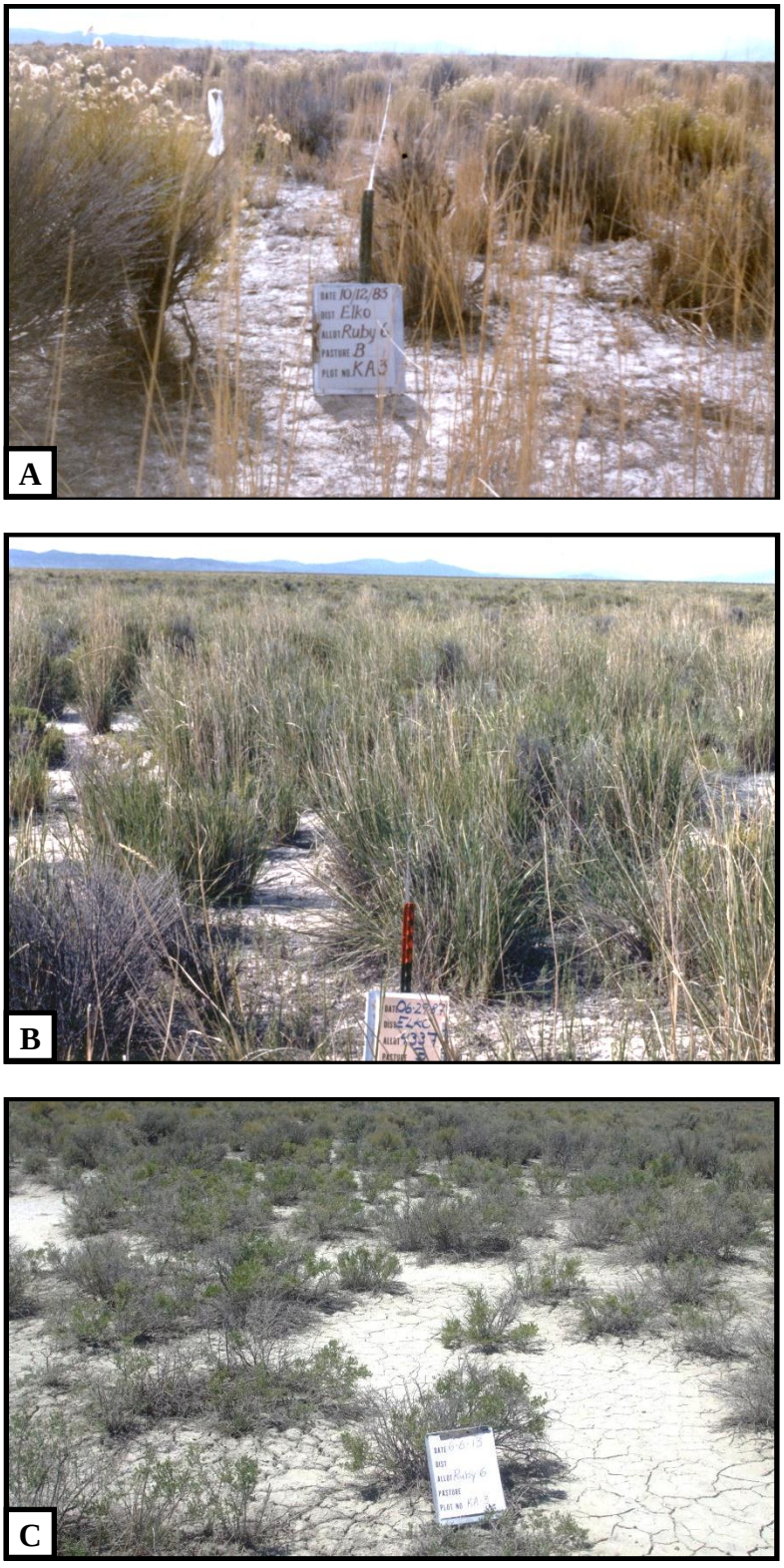
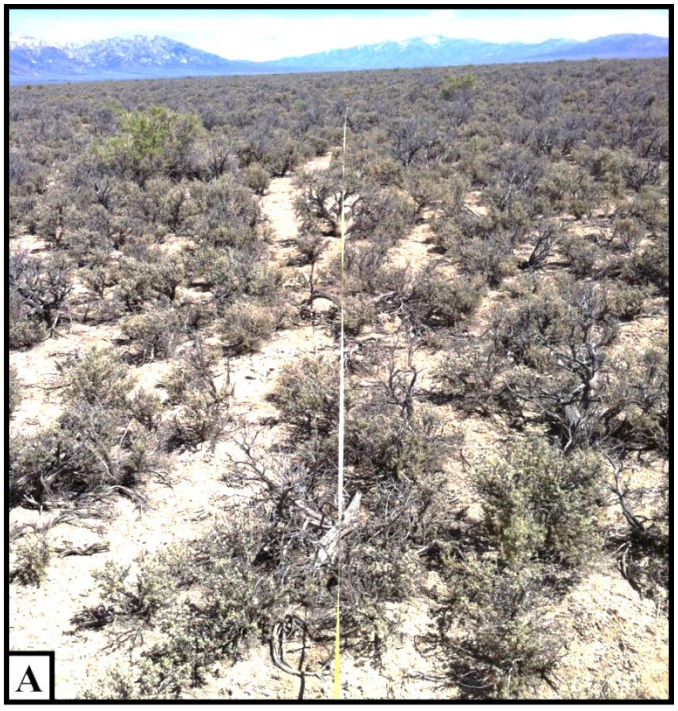
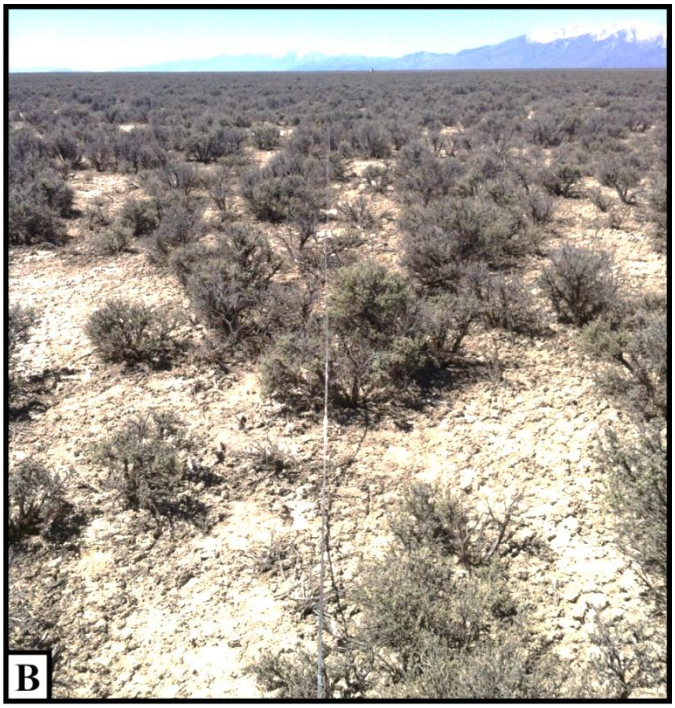


Figure 12. Site-level repeat photography at key area KA-3. Photo dates are A) 08 September 1983, B) 29 June 1987, and C) 06 June 2013.


A


B

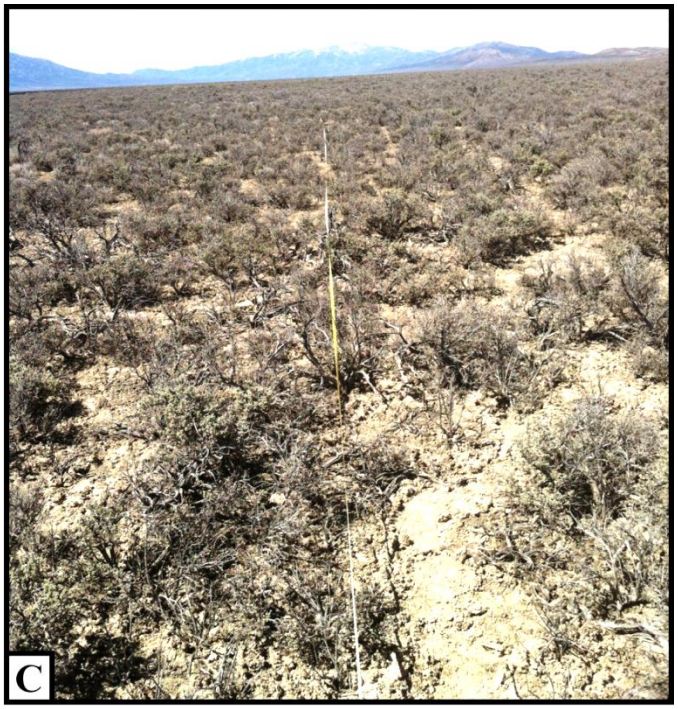
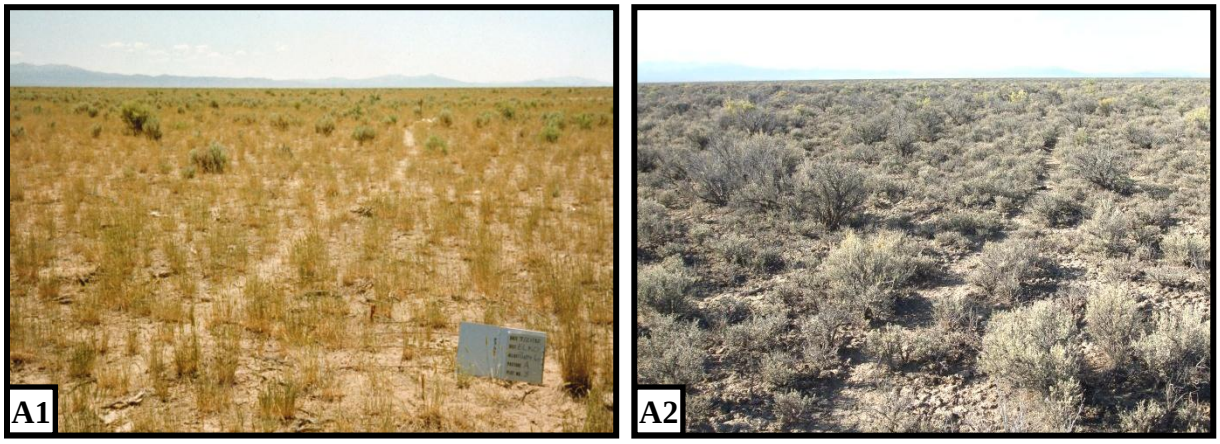


Figure 13. Site-level photographs of sagebrush rangelands within the Ruby #6 allotment. Photos were taken at randomly selected sage-grouse sites A) SG-2, B) SG-3, and C) SG-4 from May-June 2013. All photos display the near complete absence of an herbaceous understory.

Figure 14. The boundary fence between pastures B and C. The fence has four strands with 10”-10”-10”-10” spacing and lacks a bottom smooth wire. Posts are approximately 50’ apart and the wires are not marked to make them visible to sage-grouse and other bird species that can collide with them.

Pasture A



Pasture B

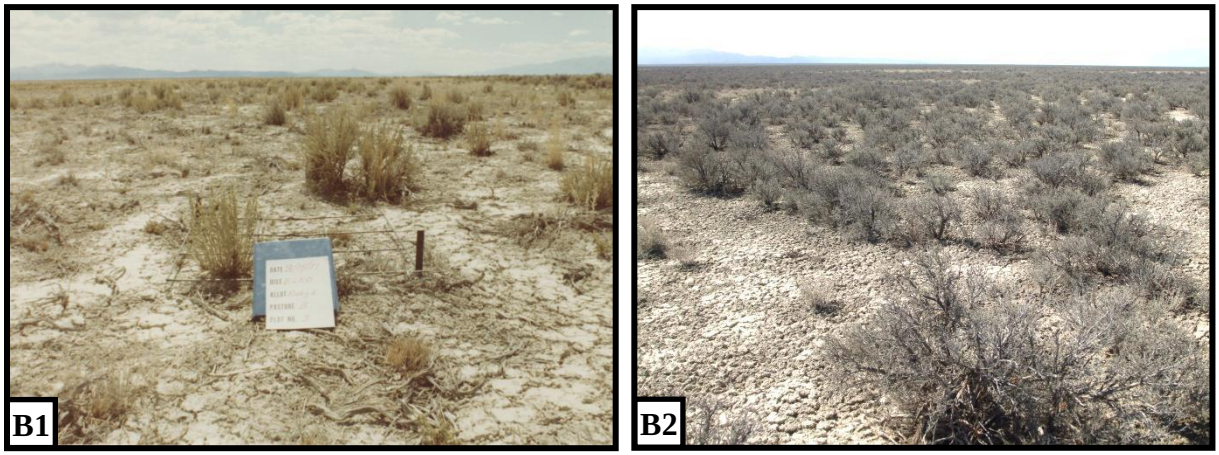


Figure 15. Repeat photography showing the decline of crested wheatgrass and the encroachment of sagebrush within the Ruby #6 allotment between the early 1980's and the present. Photos A1 and A2 were taken within pasture A on July 21st, 1980 and September 9th, 2013, respectively. Photos B1 and B2 were taken within pasture B on August 11th, 1981 and September 9th, 2013, respectively.

A.6. Cover

Foliar and ground cover were measured at KA-1, KA-2, and KA-3 in 2010 and 2013 using the point cover method, in which cover data were collected at 600 systematically located points within a key area (Swanson et al. 2006). This method quantifies soil cover, including vegetation, litter, rocks and biotic crusts. These variables can be related to wind and water erosion, and soil infiltration and percolation, and can be used to determine the ability of the site to resist and recover from degradation (Herrick et al. 2005). Live vegetation point cover data at each key area was interpreted within a general rangeland health framework and then compared to ESD data. These results are summarized in Figure 16.

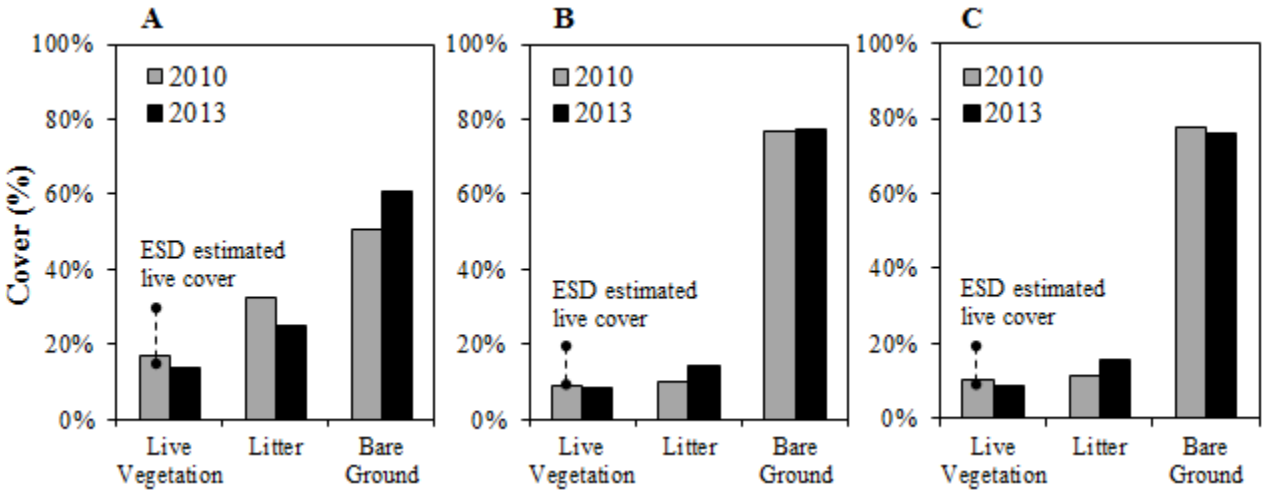


Figure 16. Cover values for A) KA-1, B) KA-2, and C) KA-3. The dashed line represents the range in live cover estimated for each key area, based on ecological site.

The line intercept method for quantifying vegetation canopy cover (Connelly et al. 2003) was used at four monitoring sites to determine the suitability of designated PPH for sage-grouse (Appendix B, Map 3). The area these four sites were selected from was determined using the following protocol: Ruby #6 PPH falling within Wyoming sagebrush-dominated ecological sites was identified, all areas more than 0.25 miles from a road were eliminated for ease of access, and all areas less than 0.25 miles from the nearest livestock watering site were removed to create the final selection area. The four sites were stratified within this area by pasture to ensure sampling of all pastures (one site each fell within Pastures A and B, two sites fell within Pasture C). The line intercept method was used at each site along 100' transects. The height of the nearest grass and shrub to the transect at five foot intervals was measured and averaged across the transect for reporting and analyses. These data are summarized in Table 5.

Table 5. Percent cover (CV), percent composition (CM), and mean heights (HT; cm) of vegetation classes at four randomly selected sites in Preliminary Priority Habitat for Greater Sage-Grouse in the Ruby #6 Allotment. Sites were sampled in May-June 2013.

Veg Class	SG-1			SG-2			SG-3			SG-4		
	CV	CM	HT	CV	CM	HT	CV	CM	HT	CV	CM	HT
Grass	1.5	3.7	15.7	0.1	0.3	12.2	0.0	0.0	N/A	0.0	0.0	N/A
Forb	0.2	0.5	N/A	0.6	1.8	N/A	0.0	0.0	N/A	0.0	0.0	N/A
Shrub	38.8[1]	95.8	43.5[2]	30.6[1]	97.9	28.7[2]	16.7[1]	100.0	37.8[2]	11.8[3]	100.0	27.7[2]

[1]Composed entirely of sagebrush
[2]Live sagebrush only (Connelly et al. 2000)
[3]99% sagebrush

Table 6. Sagebrush vegetative characteristics recommended by Connelly et al. (2000) for productive sage-grouse habitat in arid sagebrush sites.

	Breeding		Brood-rearing		Winter[1]	
	Height (cm)	Canopy (%)	Height (cm)	Canopy (%)	Height (cm)	Canopy (%)
Sagebrush	30-80	15-25	40-80	10-25	25-35	10-30
Grass/forb	>18	≥15	variable	>15	N/A	N/A
Area[2]	>80		>40		>80	

[1]Values for height and canopy coverage are for shrubs exposed above snow.
[2]Percentage of seasonal habitat needed with indicated conditions.

A.7. Pronghorn Antelope Habitat Rating

Pronghorn antelope habitat was rated at key area AY-1 in 1989 and 2013. The results of this habitat survey are summarized in Table 7.

Table 7. Pronghorn habitat ratings in year-round habitat in Pasture B, 1989 and 2013.

Date: **2013**	Wildlife Season of Use: Pronghorn year-round	
A. Water Availability Rating:		
Miles to Water (to 1/2 mile)	1.5	13
B. Vegetation Quality Rating:		
Forbs (to 0.1%):	0.0%	0
Grasses (to 0.1%):	31.6%	13
Shrubs (to 0.1%):	70.4%	3
C. Vegetation Quantity Rating:	431	5
D. Vegetation Height Rating:	20	10
Total Score:		44
Rating:		Fair
Comment: Used data from 2013 production. Vegetation quality and quantity from 2013 production. Vegetation height from 2013 ocular estimate.		

Date: **1989**	Wildlife Season of Use: Pronghorn year-round	
A. Water Availability Rating:		
Miles to Water (to 1/2 mile)	2	10
B. Vegetation Quality Rating:		
Forbs (to 0.1%):	0.0%	0
Grasses (to 0.1%):	50.0%	20
Shrubs (to 0.1%):	50.0%	4
C. Vegetation Quantity Rating:	179	3
D. Vegetation Height Rating:	21	10
Total Score:		47
Rating:		Fair
Comment: Used data from 1989 production. Vegetation quality and quantity from 1989 production. Vegetation height from 1989 ocular estimate.		

A.8. Utilization

Utilization is an estimation of the proportion of annual production consumed or destroyed by livestock or wildlife (BLM 1999b; Swanson et al. 2006). Utilization objectives in the Ruby #6 allotment are centered on limiting annual use of winterfat to 15%; of the nine utilization data points recorded for winterfat, there were only two years where this 15% threshold was exceeded, 1980 (24%) and 1981 (20%). There are no stated utilization objectives for other key species in the allotment.

The key species method (BLM 1999b) was used to collect utilization data on the Ruby #6 allotment. Utilization data was generally collected at key areas, but supplemental data collection sites were also used. Figure 17 summarizes all utilization data collected between 1977 and 2010 for basin wildrye and crested wheatgrass.

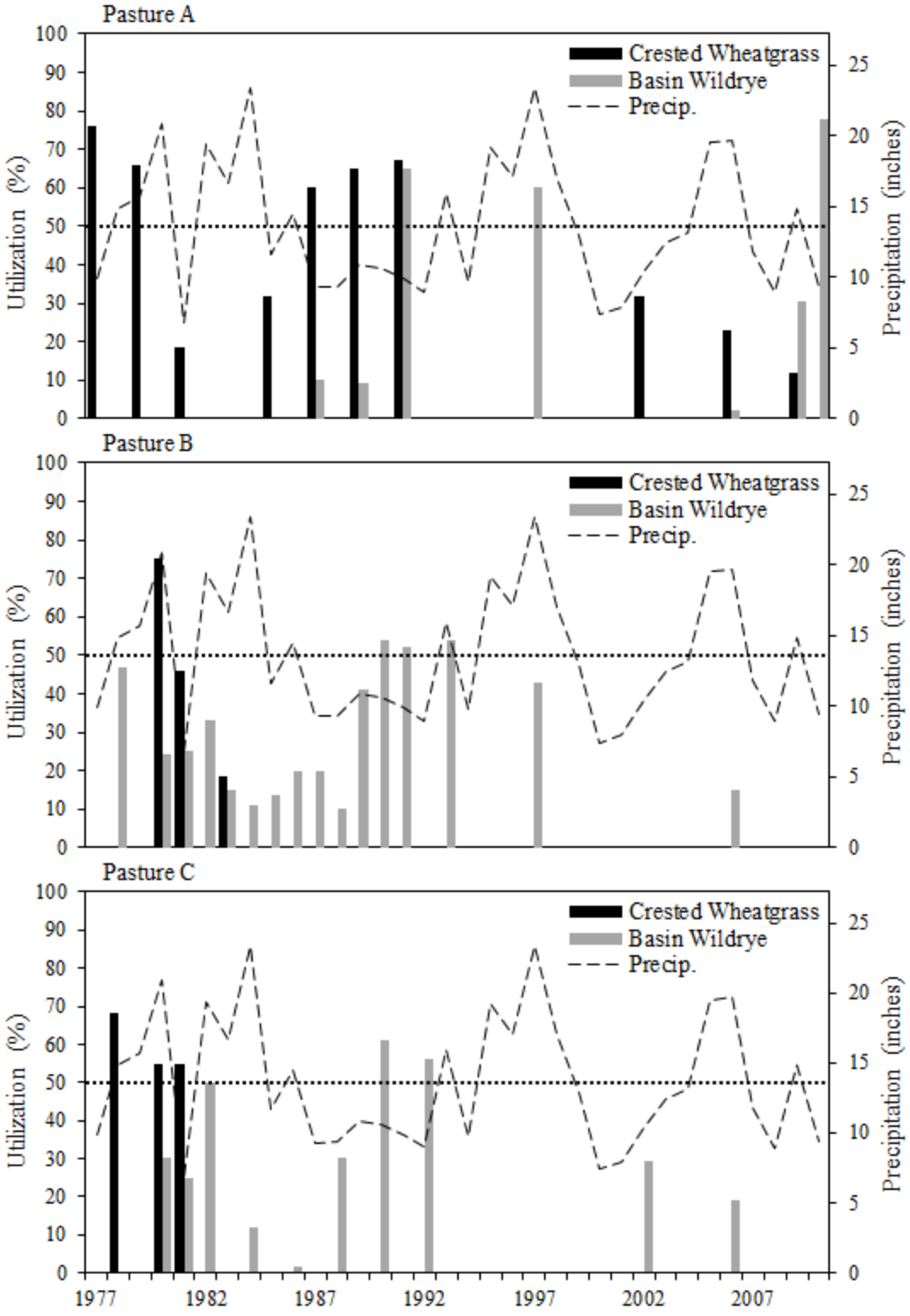
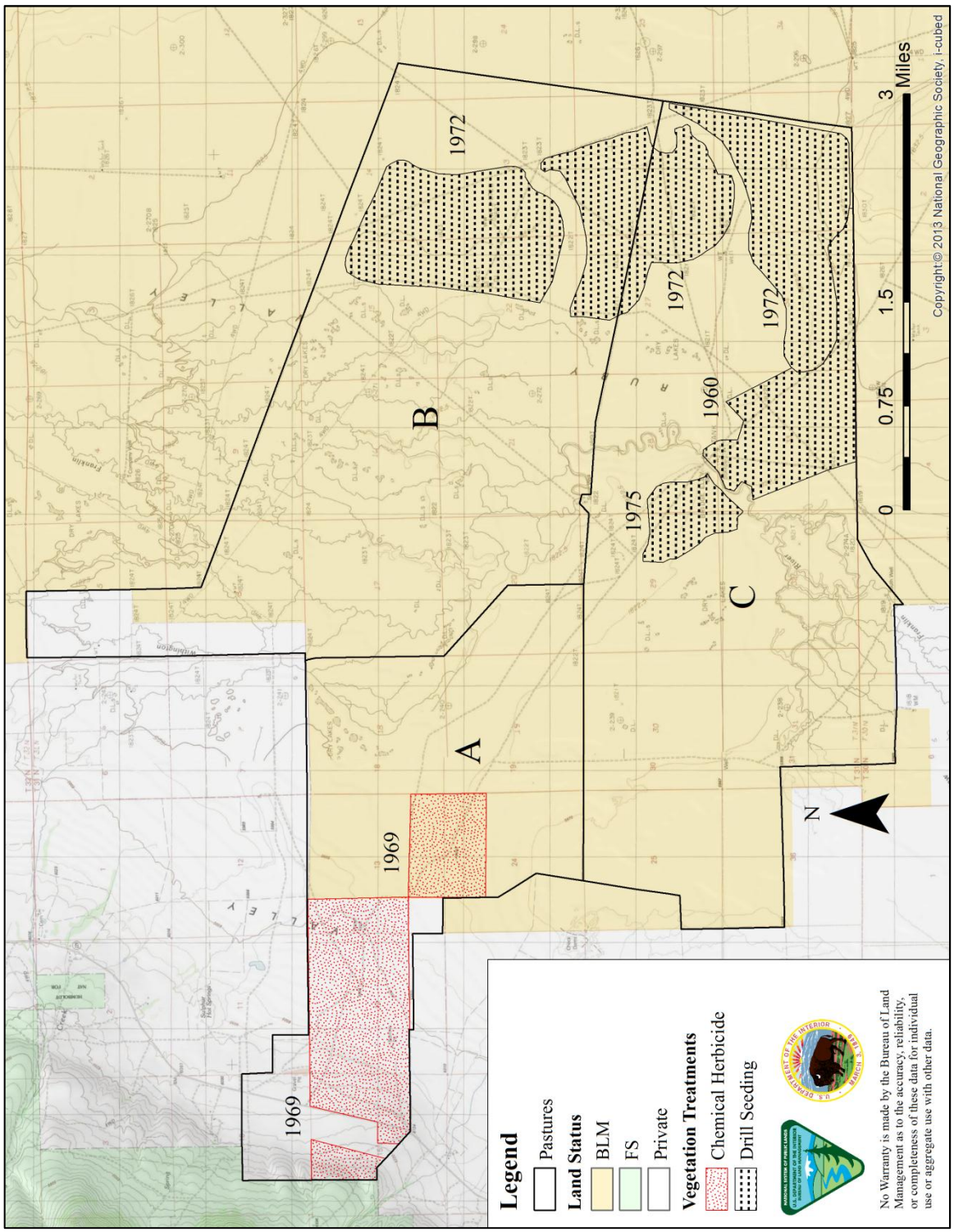


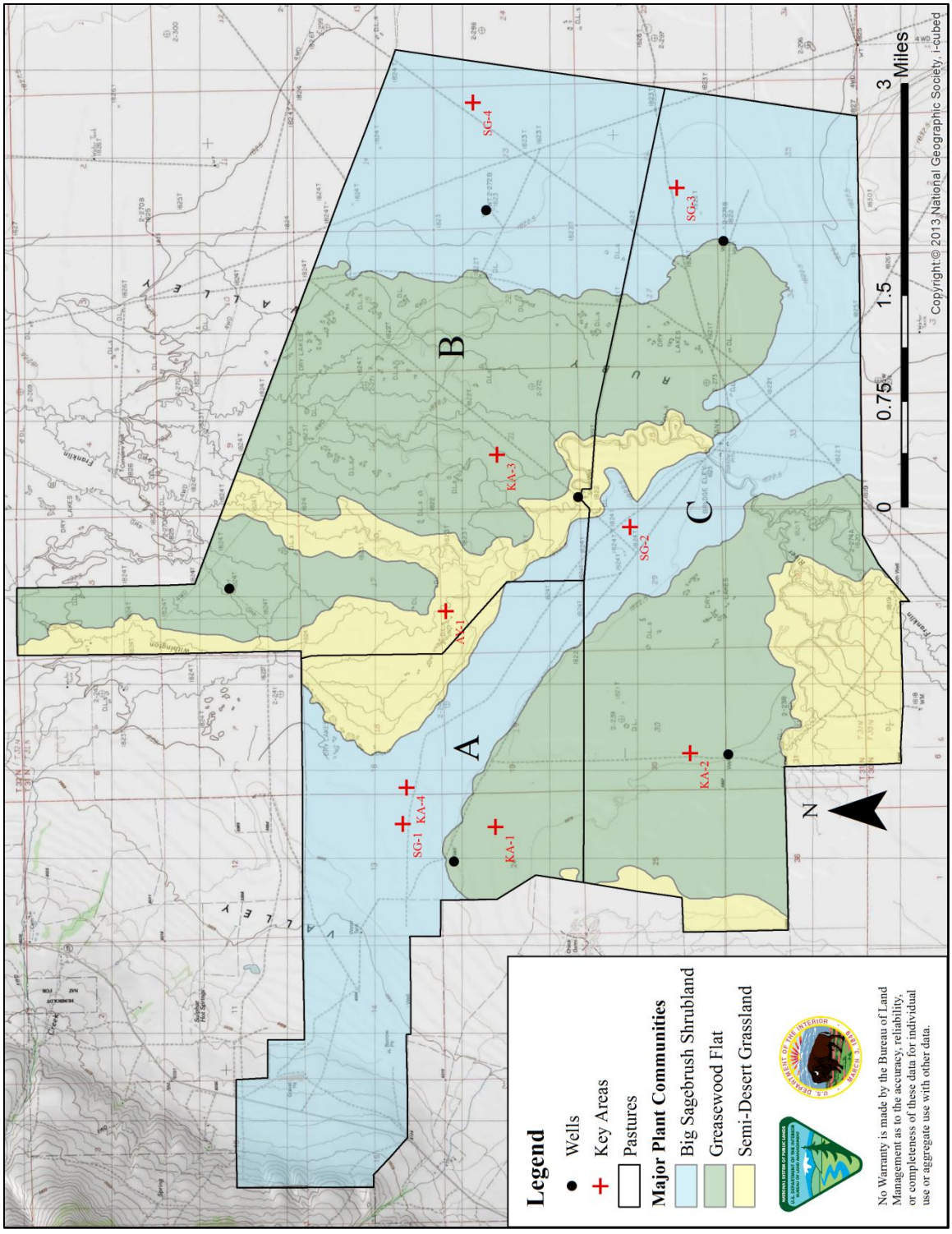
Figure 17. Utilization and crop-year precipitation data by pasture for Ruby #6, spanning from 1977-2010. The center dotted line indicates both 50% utilization and average 1972-2012 crop-year precipitation. Precipitation data was acquired from the Ruby Lake National Wildlife Refuge weather station (26 miles southwest of the Ruby #6 allotment).

Appendix B. Maps

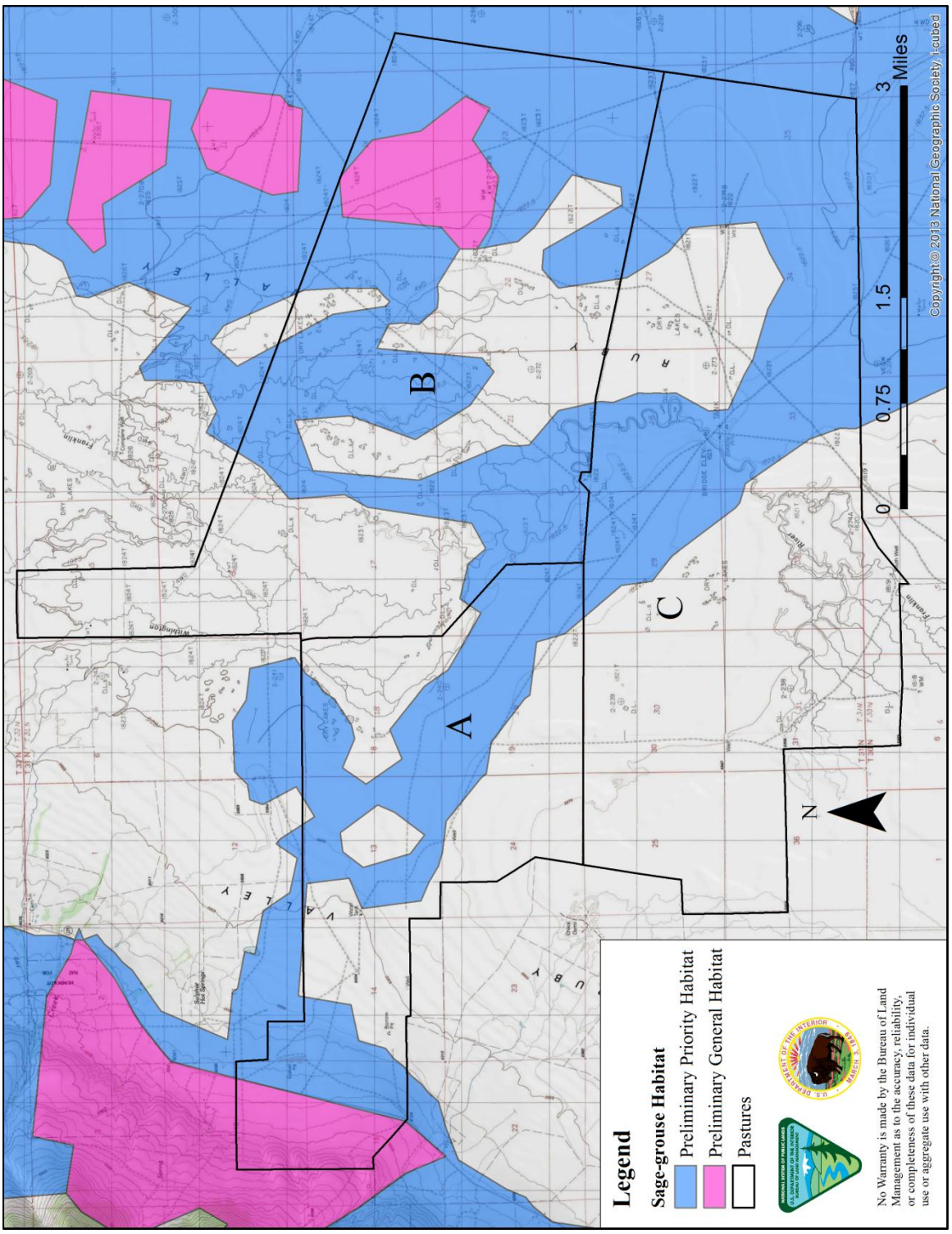
Map 1. Vegetation treatments conducted in the Ruby #6 allotment; dates indicate the year of treatment. Pasture names are indicated with uppercase lettering.



Map 2. Major plant communities, key areas and wells found in the Ruby #6 allotment. Pasture names are indicated with uppercase lettering.



Map 3. Sage-grouse habitat value relative to the Ruby #6 allotment.



Appendix C. Elko BLM Special Status Species

Scientific Name	Common Name	USFWS Status[1]	NV Range[2]	BLM Criteria[3]
Amphibians				
Rana pipiens	northern leopard frog		YR	1,2
Rana luteiventris	Columbia spotted frog (including Toiyabe spotted frog subpopulation)	Candidate	YR	1,2
Birds				
Falco peregrinus	Peregrine Falcon		YR	
Accipiter gentilis	Northern Goshawk		B	1
Aquila chrysaetos	Golden Eagle		YR	2
Haliaeetus leucocephalus	Bald Eagle		YR	1
Buteo regalis	Ferruginous Hawk		B	1,2
Buteo swainsoni	Swainson's Hawk		B	1
Centrocercus urophasianus	Greater Sage-Grouse	Candidate	YR	1
Charadrius alexandrinus nivosus	Western Snowy Plover	T	B	1,2
Lanius ludovicianus	Loggerhead Shrike		YR	1
Leucosticte atrata	Black Rosy-Finch		YR	2
Melanerpes lewis	Lewis' Woodpecker		YR	1
Gymnorhinus cyanocephalus	Pinyon Jay		YR	
Oreoscoptes montanus	Sage Thrasher		B	1
Fish				
Gila bicolor isolata	Independence Valley tui chub		YR	2
Gila bicolor newarkensis	Newark Velley tui chub		YR	2
Lepidomeda copei	Northern leatherside chub		YR	1
Oncorhynchus clarki henshawi	Lahontan cutthroat trout	T	YR	1,2
Oncorhynchus mykiss gairdneri	inland Columbia Basin redband trout		YR	2
Relictus solitarius	relict dace		YR	2
Rhinichthys osculus lethoporus	Independence Valley speckled dace	E	YR	1,2
Rhinichthys osculus oligoporus	Clover Valley speckled dace	E	YR	1,2
Salvelinus confluentus	Bull trout	T	YR	1,2

Mammals				
Antrozous pallidus	pallid bat		YR	2
Corynorhinus townsendii	Townsend's big-eared bat		YR	1,2
Euderma maculatum	spotted bat		YR	1,2
Eptesicus fuscus	big brown bat		YR	2
Lasionycteris noctivagans	silver-haired bat		YR	2
Lasiurus cinereus	hoary bat		B	2
Myotis californicus	California myotis		YR	2
Myotis ciliolabrum	western small-footed myotis		YR	2
Myotis evotis	long-eared myotis		YR	2
Myotis lucifugus	little brown myotis		YR	2
Myotis thysanodes	fringed myotis		YR	2
Myotis yumanensis	Yuma myotis		YR	2
Pipistrellus hesperus	western pipistrelle		YR	2
Tadarida brasiliensis	Brazilian free-tailed bat		YR	2
Brachylagus idahoensis	pygmy rabbit	petitioned	YR	1
Sorex preblei	Preble's shrew		YR	2
Ochotona princeps	pika		YR	1,2
Reptiles				
none				
Insects				
Euphilotes pallescens mattonii	Mattoni's blue butterfly		YR	2
Molluscs				
Anodonta californiensis	California floater		YR	2
Pygulopsis humboldtensis	Humboldt pyrg		YR	2
Pyrgulopsis villacampae	Duckwater Warm Springs pryg	petitioned 2009	YR	2
Pyrgulopsis vinyardi	Vinyards pyrg		YR	1,2
Tryonia clathrata	Grated tryonia	petitioned 2009	YR	1,2
Plants				
Antennaria arcuata	Meadow pussytoes	Species of Concern		1, 2
Astragalus anserinus	Goose Creek milkvetch	Candidate		1, 2
Boechera falcifructa	Elko rockcress	Species of Concern		1,2
Collomia renacta	Barren Valley collomia	Species of Concern		1, 2
Erigeron latus	Broad fleabane	Species of Concern		1, 2

Eriogonum beatleyae	Beatley buckwheat		1
Eriogonum lewisii	Lewis buckwheat	Species of Concern	1
Eriogonum nutans var. *glabratum*	Deeth buckwheat		1
Ivesia rhypara var. *rhypara*	Grimy mousetails	Former candidate	1
Lathyrus grimesii	Grimes vetchling	Species of Concern	1,2
Lepidium davisii	Davis peppercress	Species of Concern	1, 2
Leptodactylon glabrum	Owyhee prickly phlox	Species of Concern	2
Mentzelia tiehmii	Tiehm blazingstar		1
Penstemon idahoensis	Idaho beardtongue		2
Phacelia minutissima	Least phacelia	Species of Concern	2
Potentilla cottamii	Cottam cinquefoil	Species of Concern	1
Ranunculus triternatus	Obscure buttercup		1
Silene nachlingerae	Nachlinger catchfly	Species of Concern	1

[1]**Candidate**: Species for which the FWS has sufficient information on their biological status and threats to propose them as endangered or threatened under the Endangered Species Act, but for which development of a proposed listing regulation is precluded by other higher priority listing activities.
Petitioned: petitioned for listing as a Threatened or Endangered species.
T: Listed as Threatened.
E: Listed as Endangered.
Species of Concern: An informal term used to refer to species that are declining or appear to be in need of conservation.

[2]**YR**: Year-round resident
B: Breeding season resident

[3]**1.** There is information that a species has recently undergone, is undergoing, or is predicted to undergo a downward trend such that the viability of the species or a distinct population segment of the species is at risk across all or a significant portion of the species range, or
2. The species depends on ecological refugia or specialized or unique habitats on BLM-administered lands, and there is evidence that such areas are threatened with alteration such that the continued viability of the species in that area would be at risk (From BLM Manual 6840-Special Status Species Management).

Appendix D. References

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